DOCUMENT RESUME

ED 434 675 IR 057 519

AUTHOR Newton, Robert; Marcella, Rita; MacLennan, Alan; Middleton, Iain

TITLE Using the Internet To Support Lifelong Learning: The Role of the Librarian.

PUB DATE 1998-06-00

NOTE 14p.; In: The Challenge To Be Relevant in the 21st Century: Abstracts and Fulltext Documents of Papers and Demos Given at the [International Association of Technological University Libraries] IATUL Conference (Pretoria, South Africa, June 1-5, 1998), Volume 18; see IR 057 503.

AVAILABLE FROM For full text: <http://educate.lib.chalmers.se/IATUL/proceedcontents/pretpap/newton.html>.

PUB TYPE Reports - Descriptive (141) -- Speeches/Meeting Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS Academic Libraries; *Access to Information; Directories; Distance Education; Educational Change; Educational Environment; Foreign Countries; Higher Education; *Information Skills; Information Technology; Instructional Materials; *Library Role; *Library Services; *Lifelong Learning; Open Education; Research and Development; Users (Information); *World Wide Web

IDENTIFIERS Robert Gordon University (Scotland); *Web Sites

ABSTRACT

This paper illustrates practical situations in which librarians are beginning to have an impact on developments on the Internet and ultimately have an impact on lifelong learning by providing organized interfaces to resources. In the area of information skills training, it is argued that the librarian must contribute actively by developing these resources and ensuring that students and academic staff are made aware of their critical importance to learning. The first section of the paper discusses the new role for information professionals, focusing on two critical developments--increasing knowledge and use of new technology by users of library services, and changes in the philosophy of teaching and learning and in the environment in which teaching takes place. The following World Wide Web-based research and development projects at Robert Gordon University (Scotland) and their implications for information professionals are described in the second section: (1) NETLEARN, a project that developed a directory of Web-based materials to support teaching and learning Internet skills; (2) ReMOTE, a project that developed of a directory of Web-based teaching and learning materials on research methods, a library of in-house materials, and an interface to allow incorporation of these materials in higher education programs; and (3) Information Skills, a scheme that developed a Web-based directory to support open or distance learners. (Contains 24 endnotes and 17 references.) (MES)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 434 675

IATUL

USING THE INTERNET TO SUPPORT LIFELONG LEARNING: THE ROLE OF THE LIBRARIAN

Newton, Robert, Marcella, Rita, MacLennan, Alan and Middleton, Iain

School of Information and Media,
The Robert Gordon University
Scotland

E-mail: r.newton@rgu.ac.uk

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

N. Fjallbrant

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

1. Introduction

The role of the Internet to support teaching and learning is now being investigated by a number of academic institutions. Despite some reservations about the quality of some of the content and the fact that major issues surrounding copyright and security of data are still a significant factor in inhibiting the full potential of the Internet , most commentators would concur with the view that there is now a vast repository of solid and useful information available for exploitation. Because of the inherently flexible nature of the Internet as a platform for preparing and delivering teaching resources it seemed logical to assume that its use could be extended relatively easily to non campus based delivery and it could thus be seen as support for 'distance' or 'open' learning.

Much of the current literature in this area concentrates on the way in which academics can use the new technology to develop innovative methods of teaching and on how teaching materials can be efficiently prepared and presented in electronic format. There are a number of significant projects which have looked in detail at the development of academic staff skills and attitudes in relation to using new media for delivery and for developing resource based learning methods. [1] Less attention has been paid to the role of non-academic support for such developments and, as libraries are one of the key players in learning support (arguably the principal player) it is argued that it is imperative that we look carefully at the manner in which the new technology is changing the way in which librarians perceive and perform their function.

2. The new role for the information professional

In a sense it is unnecessary to lecture librarians on the importance of embracing information technology. Information workers have in the past been quick to identify the way in which new technology can be used to enhance the services which they have traditionally provided and the library school curriculum has reflected this [2]. However, it could be argued that until very recently the role of this technology has essentially been as an enabling factor in permitting libraries and information services to perform their traditional function of controlling the organisation of and access to bibliographic data. Thus it was not altogether surprising to find in a recent survey of Scottish librarians [3] that the attitude of librarians to the Internet and their perception of its value was restricted largely to support for traditional services - in particular as a tool for the reference librarian.

Accepting the point made by Wilson [4] that anything specific which we say about the role of the librarian in the 21st century is almost bound to be wrong because of a lack of certain knowledge of the life cycle of the profession and its usual growth curve, it is important nonetheless to try to examine significant trends. In terms of academic librarianship there are two critical developments which must be taken into account when assessing the role of the librarian in a global networked environment and these are that:

IR057519

2 BEST COPY AVAILABLE

1. there is an increasing knowledge of and use of new technology by users of library services and this provides them with rapid access to information from an increasingly rich variety of networked information resources
2. there have and continue to be changes in the philosophy of teaching and learning and of the environment in which teaching takes place, and these changes need to be reflected in the manner in which libraries respond in their role of providing training in information skills

The first of these developments may be rather crudely seen to give rise to the question of why librarians are needed at all. We have progressed through a series of developmental stages in information technology which have seen the 'ownership' of the technology progressively being the province of scientists and engineers then of document creators and custodians to the point at which we are now where the technology has passed into general ownership. If information is going to be available on-line and accessible from the desktop for all then why do we need to have librarians? Although we have not yet conducted rigorous surveys to provide an accurate measure of the extent to which students are using the Internet to gather information for their academic studies, most teaching staff would concur that, from the evidence of informal feedback from students and from the frequency in which web addresses are cited in coursework bibliographies, the Internet is now established as significant learning support tool [5]. In such an environment it is vital to the credibility of the profession that the librarian assumes a role which is "less of a warehouse manager and more of a reference consultant." [6] Myburgh [7] and Walsh [8] observe some of the changes which are already being experienced by academics and note the manner in which this will demand a new relationship between teaching staff and librarians. It is suggested that different responsibilities which librarians will be expected to assume will include controlling scholarly electronic publishing, protecting copyright and preserving intellectual property, more active involvement in promoting information literacy and 'creating order out of the chaos that is the Internet'. One way in which the librarian can do this is to take an active part in the organisation of the web. This may be done either through development and promotion of standards for describing web documents (e.g. the Dublin core metadata tags) or by actively cataloguing specific sections of the web which are of particular interest to specific groups of library users. The latter type of intervention was explored in the NetLearn and ReMOTE projects described below.

The second of these developments is inextricably interwoven with a variety of socio-economic and political factors which are currently having an impact on education in the United Kingdom. An obvious feature of higher education in the past few years has been its rapid growth. Throughout the university system in the UK there has been an increase in both student numbers and the variety and modes of attendance of courses. The MacFarlane report [9] predicted a 50% expansion of the total student population in the UK by the year 2000 and this prediction seems to have been accurate. It has become imperative that cost effective solutions should be found to deliver higher education to a wider audience and at the same time the diversity of the student population makes traditional patterns of teaching much more difficult to maintain. There is a real trend towards off campus education and a more overt recognition that academic establishments must strengthen links with prospective employers of their students - not simply in terms of collaboration over research and consultancy but in providing ongoing training which extends into the workplace. The pace of change in our technological society is so rapid that work and learning can no longer be viewed as separable and the notion of higher education as an accelerated period of knowledge acquisition in order to gain an accredited qualification is being questioned. Recent developments in the higher education curriculum for many courses have emphasized transferable skills such as information handling skills, enterprise skills and communications skills and demonstrate a serious response to the challenge of preparing graduates for a working environment in which flexibility and the ability to learn are critical factors for success. This has fostered an enthusiasm for what has been termed 'lifelong learning' - the acceptance that skills and knowledge acquisition are a vital part of human activity and must be supported at every stage [10]. Part of this process is to produce high quality teaching materials which can be easily distributed to distance learners and used as the basis for continued professional development, but as was pointed out at the start of this article there is still a role for the library in supporting students and assisting learners to make full use of these resources and others which are available to them. Taken in conjunction with what has been said about the nature and location of the learners who require this support it is contended that effectively the librarian is inevitably going to look at ways in which training in information skills, which is traditionally offered to all campus

based students, can be effectively delivered to support a much wider range of users. The manner in which this support may be offered is considered below when looking at the Information Skills for Open Learning projects.

Ultimately as Wilson concludes in his article on the role of the librarian in the next century, "in the end the future role of the librarian is going to be what you [the librarian] want it to become - and I speak for those for whom the early years of the 21st century will be within their working lives" [11] It is contended that in order to stay relevant in the next century action must be taken in relation to the trends identified above. Librarians have to become adept as information intermediaries to both 'real' and 'virtual' collections. We need to produce professionals who are adept both at handling the technology and understanding how it can be appropriately applied in library and information centres. This implies not only that librarians have to be equipped with the necessary ICT skills in order to undertake this role but that they also have to make a significant effort to broaden and apply their traditional skills as information managers to encompass electronic resources. Evidence of the demand for this type of graduate has been found and has prompted the School of Information and Media at the Robert Gordon University to offer 2 new courses - a postgraduate Masters in Electronic Information Management which is offered jointly with the School of Electronic and Electrical Engineering and an undergraduate programme in Computing and Information which is provided in conjunction with the School of Computing and Mathematical Sciences.

As Ferguson points out when considering the role of the academic library, 'It becomes more a concept with emphasis on services than a place with emphasis on collections' [12]. The move towards converged services (library and computing services) has to a certain extent accelerated this process. But it could be argued that this convergence of information services within academic communities must also be expanded to encompass more active co-operation between all sectors of the library community in order to build integrated networks to facilitate both access to learning resources and skills to use these resources effectively. The role of the librarian will thus require people or groups of people with sufficient expertise to manage the technology and a firm knowledge of the important objectives which have to be achieved in terms of the new services which the library has to offer and the global environment in which these services operate.

3. Web based Research and Development projects at RGU

The impact of the Internet on teaching and learning has been a subject of concern to a group of researchers at the Robert Gordon University over the past two years or so. The approach taken to the question of how librarians can prepare themselves for their new role in electronic networked environments has been essentially practical and the team have sought to develop projects which provide practical evidence of the manner in which the information professional can operate effectively rather than simply to speculate on the potential benefits or threats to established working practices. At the outset of the first of these project (NetLEARN) it was obvious that the technology was in a state of flux but it was decided that there was much to be gained from experimenting with use of systems in order to establish procedures and expertise in developing web resources even if (as proved to be the case) the actual systems might require considerable modification in the light of possibilities offered by new hardware and software. This paper will outline some of the projects on which the researchers have been engaged and demonstrate how these relate to the general theme of how librarians can effectively support learning via the Internet.

3.1 NETLEARN

The NETLEARN project was a SHEFC (Scottish Higher Education Funding Council) initiative which involved the development of a WEB site at The Robert Gordon University which provides a directory of resources to support academics and students who wish to retrieve relevant information on WEB based materials to support teaching and learning Internet skills. The project was initiated in 1996 and development and maintenance of the site is ongoing.

The initiative was developed largely as a response to meeting the challenge of providing an easy means for educators to access the growing range of teaching materials which were available directly or

promoted via the Internet. In 1996 Shotsberger surveyed existing efforts at using the Internet for instructional purposes [13] but any attempt to provide a comprehensive survey today would be doomed to failure. Keeping pace with the growing number of Web based resources and quickly determining their relevance for specific teaching applications was becoming a gargantuan task.. It had become apparent to many commentators that the rapid growth of such resources was creating considerable difficulties because of a range of familiar problems : inadequate organisation of the WEB; deficiencies in search engines; and the lack of a standard description of WEB based materials.

For librarians these problems might be translated into the more familiar problems of classification and cataloguing: however, the traditional approaches offered by librarians to provide solutions to these problems for large print based collections of resources were obviously inappropriate for providing a practical solution to the very real need to develop a support mechanism for academics working in this field. The proliferation of a large number of Web sites with very similar content both exacerbated the problem and indicated the need to raise awareness of existing materials in order to stem the tendency towards duplication of effort. Despite the much heralded development of more sophisticated search engines to increase the relevance and precision of the material provided in response to user queries those who have experience of searching the WEB would generally concur that search tools remain inadequate with respect to providing precise, detailed and exhaustive indexing of the vast "hyper-structure" of the Internet, subject as it is to continual extension and revision. In order to examine the practical problems which information workers would face when attempting to subject part of the web to 'bibliographic control' that the project sought:

- to identify educational and Internet training resources presently available via the World Wide Web
- to create a directory of Web-based educational resources which would allow others to identify these resources, locate them and evaluate their relevance and utility
- to make the NetLearn directory available via a Web site which would provide for users critical and descriptive information about the educational sites and allow users to connect directly to the sites themselves

Newton et al. [14] provide a description of the methodology by which the site was developed. Essentially, directory entries were created for identified resources and these were collated into an HTML (HyperText Markup Language) document which was placed on The Robert Gordon University's WWW server. Entries for all selected sites include an abstract, consisting of an overview of the available materials, together with a number of fields indicating the nature of the site in terms of, for example, the medium of delivery, the presentation style of the site, the site's currency and additional evaluative comments. The 'catalogue' entries were created using a format illustrated in the following example:

> **Beginners Central - Excellent online tutorials covering the basics of web surfing. Manageable size, stays practical and therefore easily absorbed. Includes FAQ list and the facility to email your own questions. Beginners' Central has been rated a 4 Star site by NetGuide Magazine and I-Way magazine has chosen Beginners Central as one of the top 500 web sites in the world.**
>
> **MEDIUM: - WWW (with email question service available) STYLE: - Page turning COMMENTS: - Good coverage of practical usage issues. Well designed, highly recommended by others. CURRENCY: - Updated monthly**

Figure 1: Example of revised link and abstract

A variety of feedback mechanisms were used both to monitor use of the site and attitudes to it. The result of such evaluation showed conclusively that the NetLearn project provided a successful model for facilitating access to Internet resources which emphasises the importance of the expertise of individuals (in particular information professionals) rather then relying on technology based solutions for managing information retrieval from the web. The site can be accessed on The Robert Gordon University Web Server at:

http://www.rgu.ac.uk/~sim/research/netlearn/callist.htm

Figure 2 The Netlearn home page

3.1.1 Implications for the role of the information professional

The project aimed to show how information professionals could use their traditional skills in classification and cataloguing of resources to provide a service with added value and which went beyond the bounds of single institutional catalogues of resources. It is suggested that the extension of the methodology employed in this subject area to others would provide considerable benefit to those who wish to identify relevant WEB based materials. The feedback from the NetLEARN project certainly seems to indicate an enthusiasm for providing a directory to assist ease of access to educational resources within a narrow subject range. The challenges for the future are:

- how to expand on this approach and develop a strategy which may prove to be more generally applicable to a more extensive organisation of the Internet and
- how to implement a strategy for systematically maintaining such initiatives.

There is a role for a range of participants via some form of collaboration amongst those that have traditionally been involved in the production of bibliographic tools, such as publishers, interest groups, academics and libraries. There is also, it is argued, a need for an overarching vision that would determine how those developing such tools might together work towards a form of 'universal bibliographic control' of the Internet, avoiding unnecessary duplication and gaps. It is suggested that, as indicated by some user feedback from academic and educational support services staff, this is an area in which libraries could play a central role. This echoes the sentiments of Schneiderman [15] that, because of their skills, librarians potentially have a key role in 'organising the Internet'.

The task of creating and maintaining Internet directories to cover a large range of subject areas is obviously too daunting for any single library. However, it is suggested that by developing a suitable strategy to develop a collaborative approach by the library community a significant impact could be made by providing a range of well maintained Web directories. Indeed the creation and integration of such directories with the print based collections of a particular library provides an opportunity for the library to enhance its service significantly by organising and providing access to a much wider range of information sources. Furthermore, in what has been termed the Hammond Initiative project EARL is currently investigating the potential for development of a large range of subject specialist Internet sites to facilitate access to and use of a range of topics (from a public library reference service perspective) and to "index them and keep them available for public library staff to use as reliable and authenticated sources of information" [16]. The project team suggest that NetLearn may provide a useful framework for developing such an initiative.

3.2 ReMOTE

The ReMOTE project was an internally funded initiative at the Robert Gordon University which involved the development of a web site which aimed to:

- provide an organised directory of external links to other WWW based teaching and learning materials on research methods
- integrate this with a 'library' of materials which had been produced in-house and were to made available via the Web and
- provide an interface to allow incorporation of these materials on a variety of taught undergraduate and postgraduate programmes.

Virtually all UK Higher Education Institutions teach research methods, either at the latter stages of undergraduate study or in postgraduate programmes, where research methods is seen as a key component in preparing students to undertake study leading to an MA or MSc qualification. Typically the topic is taught as a programme of lectures and seminars.

The key features of research methods which makes it an appropriate area to develop as an internet

resource are that:

1. it is generic and transferable. The end product will be applicable throughout RGU and all HEIs across a wide range of courses.

2. because of the wide range of potential topics which it is designed to support, students find that they may have to concentrate their efforts unevenly on different components within research methods: some may, for example, require more detail on quantitative analysis, whilst others do not need to study this topic in such depth because it will not be applicable to the type of dissertations or projects in which they are engaged. It is envisaged that the basic units will be extensible to allow students to explore in greater depth areas of the subject which are of interest to them whilst clearly making them aware of the knowledge and procedural requirements for achieving credits on the course, by exploring web links to more specialist sources. As such, the system will be particularly useful on postgraduate programmes of study, where students may require simply to upgrade some specific skills or techniques and can do so on an Open Learning basis.

3. the environment in which the project will be operating (the WWW) is one which is intrinsically important in conducting practical research and the mechanism of delivery can be viewed as an important part of the learning process itself.

It is therefore apparent that such a widely applicable skill as Research Methods, and such a ubiquitous medium of delivery as the WWW are ideally suited for the development of a resource centre which will be of global utility. While it is acknowledged that other WWW resources exist for teaching Research Methods or facilitating in the research process, the former typically concentrate on a subset of skills appropriate to a particular discipline or a single aspect of Research Methods, while the latter (e.g. SOSIG) [17] tend to offer sites of use to researchers, and a few selected sites for teaching the subject. Pachnowski et al. [18] provide a useful discussion of some of the sites available which provide databases and examples of surveys of resources (e.g. the US Census Bureau http://www.census.gov) and the Gallup Organization http://www.gallup.com) but does not provide any detailed guidance on application of these resources in teaching. Useful resources are also provided by a range of directories - the Educator's Internet Yellow Pages [19] being a particularly good starting point. More specifically related to research methods work by Cozby [20] provides an excellent guide to resources - each chapter of the book directing the student to a wide range of web resources and there are a number of web sites which give detailed tutorials on specific research methods concerns or techniques (e.g. BeLue's Choosing a research design http://trochim.human.cornell.edu/tutorial/belue/belue.htm and Burn's pages on Securing internal validity http://trochim.human.cornell.edu/tutorial/burns/int.html). The aim of ReMOTE was not only to provide a direct link to such specialist sources but also to integrate this with easy access to teaching materials which had already been developed within the University and which the project team converted from paper based to web documents. Both categories of material were to be used as "plug ins" when developing tailored Research Methods courses tailored for specific taught programmes. It was envisaged that staff would create pathways through the 'electronic library' which was being built up by making links from online programme descriptors to appropriate 'readings' - using links to online materials in the same way as references to the sources would normally be given in paper based documents. This resource library might therefore contain, for example, interactive CAL packages, which are available freely via the WWW and which could be conveniently downloaded and used in teaching or self-study, online texts or journal articles or sources of statistical data. The project, therefore, sought to extend on the experience gained in creating the NetLearn directory to cover additionally the problems posed by integrating an in-house library of materials to which there were necessarily limitations of access for non-registered students. In addition to developing research methods teaching materials the project team have also experimented with using the same interface to develop and deliver materials on Communications Skills and are currently involved in a project to deliver parts of a teriary level teaching programme via the web. The ReMOTE site is available at:

http://jura2.eee.rgu.ac.uk/dsk5/research

Fig. 3 The ReMOTE home page

3.2.1 Implications for the role of the information professional

It became apparent that there were a number of issues related to the development and maintenance of the ReMOTE directory which fell directly within the domain of the information professional. As with NetLearn, there was obviously a role in maintaining the directory itself but additionally it was felt that the areas of this project which involved questions related to copyright of material, rights for downloading or mirroring material from other Internet sites and provision of advice to staff on legal and ethical issues in the use of online sources were areas which should fall directly within the domain of the librarian.

In examining feedback it was also recognised that an important area in which ReMOTE was weak was that it was not an integrated environment for all teaching materials. At the least it was felt that to compensate for the relatively small amount of material available in comparison with the print based materials held in the University library that students should have been provided with a transparent interface to the library catalogue to see a wider range of relevant published material in very specific disciplines. They would then have been able to check its availability at the point at which they were making use of the online materials. Indeed students should ideally have been able to access to some of these published materials in electronic form. Such considerations were beyond the remit of the project which only examined the use of freely available electronic resources on the web and the materials specifically written by academic staff of the University to support their teaching and which could be made available via the web. Again, however, it provided evidence of the important role which the information professional could potentially fulfil in integrating bibliographic data and digitised texts within tailored learning environments. Certainly some of these issues are being examined and the development of 'virtual library' collections by projects such as SCOPE, LAMDA and e-LIB are significant developments in this respect and there are a host of projects concerned with the development of electronic journals. But it was felt that the current mode of access to electronic materials was too fragmented and administratively restrictive when attempting to create a learning environment in which the student has access to the material without necessarily having to be unduly concerned about the mechanics of getting it.

The ReMOTE project also involved the project team in careful consideration of mode of access to materials for students and inevitably the way in which they system could potentially support distance learners. Whilst provision of tailor made materials via the web offered potential benefits for distance learners there were practical problems related to security of the University Intranet and security of copyright. The digitisation of material for distribution via the web is potentially critical in terms of the development of the information professional's role in supporting all learners but the careful management of access to the material is equally critical. In terms of digital collections of materials we have a reflection of some of the inbuilt inequalities which currently apply to print based library collections. Whilst few would argue with the principle that all students should be given access to the full range of a library's collection, in fact it is obvious from preliminary review of provision for distance learners that there are considerable inequalities in provision [21]. The project team were thus enthusiastic when offered the opportunity to collaborate with a public library authority in a project which sought to create a much more integrated approach to proving access to Internet resources in a public library environment.

3.3 Information Skills

Early in 1996 South Ayrshire Libraries submitted a proposal to the British Library Research and Innovation Centre's Digital Libraries Programme. The proposal outlined a plan to enhance public library support to users who were engaged in open or distance learning by identifying and classifying a range of learning resources which could be accessed over the Internet. This was to be accomplished by designing and developing a Web based directory to support open learners. In addition it was planned that references to locally held open learning material should also be included in the directory. The proposal included a preliminary stage which involved collaboration with the Robert Gordon University School of Information and Media to develop information and skills training for independent learners. It was envisaged that this would take the form of a Web based resource which collated various learning skills packages which have are currently available on the Internet. This could then be used as the basis for developing Information Skills courses which could be run locally by staff in the public library.

The key to providing students with a knowledge of what is available to support their studies is through the information services provided by the libraries. In a learning environment in which we recognise the importance of exploratory learning it is vital that all students are provided with the skills to make effective use of library catalogues and other bibliographic and information databases and be given an appreciation of the most effective strategies which should be adopted when attempting to gather material or find specific answers to questions. In projects completed to date it could be assumed by the project team that students had access to some very sophisticated learning support mechanisms and in particular had transparent access to a range of university library catalogues, access to CD-ROM bibliographic databases and CD-ROM based publications But most important of all it could be assumed that students had access to training and support in the use of information services. Most students would have been provided with a fairly detailed introduction to information skills as part of their campus based studies - often via the library service.

When working on the Information Skills project in collaboration with South Ayrshire Libraries the project team found that it had to adopt an entirely different approach to developing an interface to support learners. This was mainly because of the huge diversity of the learning community and the purpose for which they wished to gain information. Within the remit of the project 'open learning' is seen as the opportunity for people to learn whatever they can, whenever they can, wherever they are. No boundaries in the type of subject specific resources to be offered and the project encompassed a wide variety of learners - business people, school, college and university students, the person who wants to acquire new skills in order to obtain employment or to make progress at work, the retired person who wishes to learn something new, the woman who wants to update her skills and knowledge in order to return to paid employment, indeed, any individual who feels that the provision of learning opportunities would bring greater fulfilment to their personal or professional lives. A different approach was also necessary, however, partly because the project team found that it was making assumptions about background skills and knowledge of these learners based on the relatively high level of information skills which were evident in the campus based students populations with which we had previously dealt. It was not the intention of the project to duplicate existing electronic resources for providing information or network learning skills. However, examination of a number of such initiatives showed that typically these were inappropriate as a starting point for providing a suitable interface for the general public. This is not a criticism of the quality of such packages but rather a recognition that most such initiatives have been developed expressly for use by academic staff and students studying within a traditional campus-based environment. For example there has been significant work in academic libraries as is evident in, for example, the EduLib project, set up following the Follett Report (http://www.hull.ac.uk./Hull/CTLS_Web/edulib/edulib.html) and Netskills (http://www.netskills.ac.uk./intro.html), which focuses on the Internet. These projects were designed expressly to help "the UK higher education community to develop network skills for teaching, research and administration" [22]. The project team therefore developed a customised information skills training package based on the work of Marland who sees the the use of information as a cyclical process, expressed as questions which would be useful to the majority of users, no matter the subject area being studied.

The questions are as follows:

1.	Why do you need the information?	This attempts to define the information need in the user's mind, in order to specify as far as possible what the requirement for information is.
2.	What kind of information do you need?	This reveals to the user, if he was not already aware of it, the range of types of information which are available, and which are useful for his purpose.
3.	How will you find the information?	Places to look for information and retrieval methods.
4.	Which information will you use?	Analysis and evaluation and organisation of the information retrieved.
5.	How will you present your information?	If a formal presentation is necessary, suggestions are made as to formats.
6.	Have you answered your question and what have you learned?	Reviewing the above process and evaluating its success.

Table 1 - Marland's Big Six Questions

The above information is presented in two ways. The initial introduction to these concepts is underpinned by a more in-depth analysis of these steps for the learner who wishes to pursue his study further. This is achieved by a series of hyperlinks.

Fig. 4 South Ayrshire Libraries Information Skills

The tutorial package also provides links to further information skills resources on the web, such as the use of browsers, search engines, reading skills, critical analysis of information, and the use of references and bibliographies. Thus, traditional information-related skills are smoothly integrated with new information skills, or IT skills as they are often called, in the aim of allowing a seamless use of information no matter how it is provided and accessed. One corollary of this method will be, hopefully, to eradicate the barriers between text-based information and electronic information for the user, and therefore to allay their potential fear of new technology. The South Ayrshire Library Information Skills site is available at:

http://south-ayrshire.gov.uk/blric/project.htm

Fig 5. South Ayrshire Libraris Information Skills homepage

3.3.1 Implications for the role of the information professional

The most significant implication for academic librarians from the work conducted in conjunction with South Ayrshire Libraries is that there is a pressing need to develop information skills packages for students. These must go beyond being introductions to particular library services and should cover the generic information skills with which all students should be equipped before embarking on a course of study. An interesting aside connected with the public library based project is that one student commented very favourably on the information skills package expressing the opinion that he wished his own library (a local academic library) had provided this sort of training. With the plethora of resources available to them and the multifarious interfaces for accessing these resources efficiently, it is imperative that library staff make a concerted effort to assist students through the 'information maze.'

To an extent this can be facilitated by using interactive teaching software which can be customised for particular environments - such as, for example, Aberdeen University Library's CALAIS package. It also requires, however, a more general approach by libraries to the issue of information skills development and in particular a collaboration between different library sectors - school, public, academic - in order to ensure that the library user can acquire and use such skills irrespective of the particular sector in which he/she is learning.

4 Conclusion

The paper has illustrated a variety of practical situations in which librarians are beginning to have an impact on developments on the Internet and ultimately having an impact on lifelong learning by providing organised interfaces to resources. In the area of information skills training it is argued that the librarian must contribute actively by developing these resources and ensuring that students and academic staff are made aware of their critical importance to learning. It is obvious that we have some way to go before we can achieve Stephens and Unwin's vision of "a more hopeful and exciting future, in which academics and librarians collaborate to expand the pedagogical boundaries of ... learning, ensuring that the electronic developments are integrated with traditional concerns for wide reading, student autonomy and independent thinking" [23].

There is, however, growing evidence of a convergence of effort by librarians to meet these objectives - sometimes in the face of administrative and market forces which focus on competitive developments. Now with more attention being given to the need for learners to assimilate a broad range of information drawn from a wide range of source material and the recognition of the importance of 'learning to learn' there is an opportunity to develop a more holistic approach to providing access to resources through the an integrated library network. Chris Yapp comments that "Our experience to date suggests that there is a great appetite in the UK for learning in all sectors of society. The goal is to harness this energy for economic and social well-being" [24]. However, there is an interim goal which has to be achieved and that is to develop a working strategy for delivering and supporting such learning. The information professional should and must be central to that strategy.

Acknowledgments

The authors would like to acknowledge the contribution of two postgraduate students, Andrew Gibson and Stephen Browne whose work on distance learning support and the changing role of the information professional has been instrumental in providing some of the observations and conclusions outlined in this paper.

References and Notes

1. Good examples of this within the United Kingdom can be seen in the Netskills project (based at the University of Newcastle) and in the activities of the TALiSMAN group within Scotland.

2. Johnson, for example, pointed out that in 1997 IT now accounted for 60% of the Information and Library Studies courses offered at the School of Information and Media at the Robert Gordon University. see: Johnson, IM Peering into the mist and struggling through it: the education and training of the future information professional. [Editorial] Journal of Librarianship and Information Science 29 (1) March 1997, p.3-7

3. Newton, R., MacLennan, A and Allison, JDC. Scottish Public Libraries and the Internet. Public Library Journal. Jan/Feb, 1998 p.2-7

4. Wilson, TD The role of the librarian in the 21st century: keynote address for the Library Association North Branch Conference, Longhirst, Northumberland, 17th Novermber 1995. Available at: http://www.shef.ac.uk/uni/academic/I-M/is/lecturer/1stcent.html

5. In a brief survey of 32 postgraduate Information and Library Studies students at the School of Information and Media, the Robert Gordon University it was found that when asked to rank a variety of information resources in order of importance in gathering information to complete their assignments, access to the Internet was seen as being equally important as access to library materials by over 25% of the students.

6. Simpson, C. The School Librarian's Role in the Electronic Age. ERIC Digest ED402928. Nov. 96. Available at http://www.ed.gov/databases/ERIC_Digests/ed402928.html Accessed April 28th

1998.

7. Myburgh, S. Virtual academic and virtual librarian: real interdependency. South African Journal of Library and Information Science, 65(1) March 1997 pp.40-45

8. Walsh, V. The future of the library professional. IFLA Journal 23 (1) 1997, pp.13-16

9. Teaching and learning in an expanding Higher Education System: Report of a Working Party of the Committee of Scottish Principals. Chaired by Professor A. MacFarlane. CSUP, 1992. 3 vols.

10. Evidence of the manner in which this is being promoted in the United Kingdom at present is available in a number of important government led initiatives. See e.g. recommendations of the Dearing and Garrick reports on higher education and the DfEE Green Paper on lifelong learning. Initiatives such as the 'University for Industry and 'University of the Third Age' and the proposals for the development of the 'people's network' based around a transformed public library service and feeding into a national grid for learning are also important developments which are supporting this development.

11. Wilson TD op. cit.

12. Ferguson, CD and Burge CA. The Shape of Services to Come. College and Research Libraries, 58(3), May 1997, p.253

13. Schotsberger, P.G. (1996) Instructional uses of the World Wide Web: exemplars and precautions. Educational Technology Vol. 36 2 47-50

14. Newton, R, Marcella, R and Middleton, I Netlearning: creation of an online directory of Internet learning resources. British Journal of Education Vol 29 No.2 1998 pp.173-176

15. Schneiderman, R.A. (1996) Why librarians should rule the Net. ENODE 1, 4 September.

16. Copeman, H. E-mail correspondence. 11th December 1997

17. SOSIG: the Social Sciences Information Gateway, URL: http://www.sosig.ac.uk

18. Pachnowkski, LM et al. Immediate Data: The World Wide Web as a Resource for Teaching Research Methods. URL http://junior.apk.net/jurczyk/eera.html

19. Place, R. et al. Educator's Internet Yellow Pages. Prentice-Hall, Englewood Cliffs, 1996.

20. Cozby, Paul C. Methods in Behavioural Research. 6th edition. 1997.

21. The issue of library support to distance learners is currently being investigated as part of an Msc programme of study by a postgraduate student at the Robert Gordon University School of Information and Media. Although the research is at an early stage there are obvious indications of very large disparities in the way in which academic libraries in Scottish universities treat distance learning students and in some cases there is virtually no attempt made to cater for the special needs of these students.

22. Netskills web site: Introductory text. (http://www.netskills.ac.uk./intro.html

23. Stephens, K., and Unwin, L. The Heart of the Matter: Libraries, Distance Education and Independent Thinking The Journal of Library Services for Distance Education, State University of West Georgia, Volume 1, No.1, August 1997

24. Yapp, Chris http://www.communities.org.uk/article/life.htm (accessed 2/11/97)

Bibliography

Akeroyd, J. Ready to take on new roles. *Library Technology* 2(1) Feb.97 p.15

Anderson, G. Re-engineering the academic library: new services through institutional alignment and leadership. Towards a worldwide library: a ten year forecast. Proceedings of the 19th International Essen Symposium. 23-26th September 1996 pp. 115-35

Armstrong, C.J. Do we really care about quality? *Online Information Proceedings* pp.49-59. Oxford: Learned Information. 1996.

Brophy, P. Networking in British academic libraries. *British Journal of Academic Librarianship* 8 (1) pp.49-60

Clyde, A. Information skills in an age of Information Technology. *Emergency Librarian* 24 (4) Mar/Apr 1997 pp.48-50

European Library Automation Group: the changing role of the librarian. http://www/konlib.nl/coop/elag/elag95/workshop/261.html

Floridi, L. The Internet: which future for organised knowledge, Frankenstein or Pygmalion? Parts 1 and 2. *The Electronic Library* 14 43 - 52, 1996

Foster, J Netskills: training users of the electronic library. *Library Technology News*, 20 1, 3-4, 1995

From librarian to cyberlibrarian: the evolving role of the information professional http://www.kensho.com/pubs/librarian-to-cyberlibrarian.html

IAC survey. Libraries changing to meet the times. *Advanced Technology Libraries* 26 (1) Jan. 1997 p.8

Kascus, MA Library support to distance students as a libray education and continuing education issue. *Journal of Education for Library and Information Science*, 35 (4) 344-347

Lavagnino, M. Networking and the role of the academic librarian: an evolutionary perspective. *College and Research Libraries* 58 (3) 1997 pp. 217-31

Matson, L and Bonsk, J. Do Digital libraries need librarians. *Online*. November 1997

Myhill, M. and Jennings, S. The electronic library and distance resourcing: the Exeter experience. *Program* 30 (2) 1996 p.111-120

Rice-Lively, M.L and Racine JD The role of academic librarians in the era of information technology. *Journal of Academic Librarianship* 23(1) Jan 1997 p.31-41

Rusch-Feja, D. Librarian education for utilizing new technologies including networked information sources. *Resource sharing and information networks*. 12 (2) 1997 p.31-47

Schiller, N. World Wide Web library support for distance learning at the State University of New York at Buffalo. *MC Journal: The Journal of Academic Media Librarianship*, 4(1) Summer 1996. pp. 25-37. Avaliable at URL: http://wings.buffalo.edu/publications/mcjrnl/v4n1/schiller.html

Back to contents

Last edited by J.F. 29th June, 1998.